

WHAT IS CLAIMED IS:

Sub A.1> 1. A breakaway support post for mounting a guardrail thereon as part of a highway guardrail system comprising:

5 an elongated body having a first end and a second end;

means for attaching the guardrail adjacent to the first end of the elongated body;

10 a plurality of slots formed in the elongated body intermediate the first end and the second end; and

the elongated body having a cross section and the slots oriented with respect to the cross section whereby an impact with one end of the attached guardrail will tend to buckle the breakaway support post and the breakaway support post will resist a rail face impact with the guardrail.

2. The breakaway support post of Claim 1 wherein the elongated body further comprises:

20 a metal I-beam having a web with a pair of flanges attached thereto; and

the slots formed in the flanges of the I-beam.

3. The breakaway support post of Claim 1 wherein the means for attaching further comprises a block disposed between the first end of the elongated body and the guardrail to form a lateral offset between the guardrail and the breakaway support post.

30 4. The breakaway support post of Claim 1 further comprising at least one soil plate attached to the elongated body adjacent to the elongated slots.

5. A breakaway support post for mounting a guardrail thereon as part of a highway guardrail system comprising:

5 an elongated body having an upper portion and a lower portion;

a rotatable coupling assembly disposed between the upper portion and the lower portion of the elongated body;

10 the upper portion of the elongated body having a first end;

the lower portion of the elongated body having a second end which may be inserted into the soil adjacent to a roadway;

15 means for attaching the guardrail adjacent to the first end of the upper portion; and

means for releasably securing the upper portion of the elongated body generally aligned with the lower portion of the elongated body whereby an impact with one end of the attached guardrail will tend to rotate the upper portion of the elongated body relative to the lower portion of the elongated body and the breakaway support post will resist a fail face impact with the guardrail.

25 6. The breakaway support post of Claim 5 wherein the rotatable coupling further comprises:

a first U-shaped bracket and a second U-shaped bracket with portions of the first bracket disposed within the second bracket; and

30 a pivot pin extending laterally through adjacent portions of the first bracket and the second bracket whereby the upper portion of the elongated body may rotate relative to the lower portion of the elongated body.

7. The breakaway support post of Claim 5 wherein the upper portion of the elongated body and the lower portion of the elongated body further comprise:

5 a metal I-beam having a web with a pair of flanges attached thereto;

a respective bracket attached to adjacent ends of the upper portion and the lower portion; and

10 a pivot pin extending through the brackets and aligned approximately parallel with the web of the upper portion whereby the breakaway support post will resist a rail face impact with the guardrail.

15 8. The breakaway support post of Claim 5 further comprising a block disposed between the guardrail and the upper portion of the elongated body and the guardrail to form a lateral offset between the guardrail and the breakaway support post.

PATENT DRAWINGS

9. A breakaway support post for mounting a guardrail thereon as part of a highway guardrail system comprising:

5 an elongated body having an upper portion and a lower portion;

the upper portion of the elongated body having a first end;

10 the lower portion of the elongated body having a second end;

means for attaching the guardrail adjacent to the upper portion; and

15 means for coupling the first portion of the elongated body with the second portion of the elongated body whereby an impact with one end of the attached guardrail will tend to rotate the first portion of the elongated body relative to the second portion of the elongated body and the breakaway support post will resist a rail face impact with the guardrail.

20 10. The breakaway support post of Claim 9 wherein the means for coupling the first portion with the second portion comprises first and second breaker bars.

25 11. The breakaway support post of Claim 10 wherein the first and second breaker bars are formed with respective chamfered surfaces to facilitate rotation of the upper portion relative to the lower portion and to facilitate separation of the upper portion of the elongated body from the lower portion of the elongated body.

SEARCHED
INDEXED
SERIALIZED
FILED

12. The breakaway support post of Claim 10 wherein
the first and second breaker bars further comprising
protruding members to facilitate rotation of the upper
portion relative to the lower portion and to facilitate
separation of the upper portion of the elongated body
from the lower portion of the elongated body.

13. A roadway guardrail system, comprising:
a guardrail;

at least one support post having an upper portion
and a lower portion, the upper portion having a lower end
and the lower portion having an upper end;

5 the upper portion being coupled to the guardrail and
the lower portion being structured and arranged to be
located in the earth;

10 the upper portion lower end comprising a first
member and the lower portion upper end comprising a
second member;

15 the first and second members being coupled together
with at least two rods, the rods laying along an ⁱⁿ imaginary line that extends ~~on~~ a strong direction,
wherein the post exhibits a high mechanical strength in
the strong direction, there being a weak direction that
is generally perpendicular to the strong direction,
wherein the support post exhibits a low mechanical
strength in the weak direction; and

JRA 5/2/98

20 at least one spacer located between the first and
second members, there being a gap on at least one side of
the imaginary line, wherein the upper portion can rotate
relative to the lower portion in the weak direction when
subjected to a force.

25
14. The roadway guardrail system of Claim 13
wherein the upper and lower portions comprise I-beams,
each of the I-beam portions having a web, with the web of
the upper portion being generally aligned with the web of
30 the lower portion, and with the imaginary line extending
generally in the same direction as the webs.

35
15. The roadway guardrail system of Claim 13
wherein the rods further comprise bolts secured by nuts.

16. The roadway guardrail system of claim 13 wherein the first and second members each comprise flanges that extend transversely from a longitudinal axis of the respective upper and lower portions.

5

17. The roadway guardrail system of claim 13 wherein the spacer comprises a projection that extends from one of the first and second members and that bears on the other of the first and second members.

10

18. The roadway guardrail system of claim 13 wherein the spacer comprises two projections, with each projection extending from a respective one of the first and second members, the projections generally bearing on each other.

15

19. The roadway guardrail system of claim 13 wherein the spacer comprises stops located on the rods.

20

20. The roadway guardrail system of claim 13, further comprising:

25

the upper and lower portions are I-beams, each of the I-beam portions having a web, with the web of the upper portion being generally aligned with the web of the lower portion, and with the imaginary line extending in the same direction as the webs;

the rods are bolts secured by nuts;

30

the first and second members each comprise flanges that extend transversely from a longitudinal axis of the respective upper and lower portions; and

the spacer comprises a projection that extends from one of the first and second members and that bears on the other of the first and second members.

21. The roadway guardrail system of claim 13,
wherein:

the upper and lower portions are I-beams, each of
the I-beam portions having a web, with the web of the
upper portion being generally aligned with the web of the
lower portion, and with the imaginary line extending in
the same direction as the webs;

the rods are bolts secured by nuts;

the first and second members each comprise flanges
that extend transversely from a longitudinal axis of the
respective upper and lower portions; and

the spacer comprises stops located on the rods.

22. A roadway guardrail system comprising:
a guardrail;

at least one support post having an upper portion
and a lower portion, the upper portion having a lower end
and the lower portion having an upper end;

5 the upper portion having a first side that is
coupled to the guardrail and the lower portion being
structured and arranged to be located in the earth;

10 the upper portion lower end comprising a first
member and the lower portion upper end comprising a
second member;

15 the first and second members coupled with each other
by a pin located along an imaginary line extending along
a strong direction, wherein the support post exhibits a
high mechanical strength in the strong direction, there
being a weak direction that is generally perpendicular to
the strong direction, wherein the support post exhibits a
low mechanical strength in the weak direction, the pin
being located on the first side of the upper portion; and

20 at least one spacer located between the first and
second members, there being a gap on at least one side of
the imaginary line, wherein the upper portion can rotate
relative to the lower portion in the weak direction when
subjected to a force.

23. A roadway guardrail system, comprising:
a guardrail;

at least one support post, the support post
comprising an I-beam having a web and flanges, the
support post having a first end and a second end, the
first end being coupled to the guardrail and the second
end being structured and arranged to be located in the
earth; and

the flanges having vertical slots therein located
near the surface of the earth when the support post is
located in the earth.

24. A roadway guardrail system comprising:
a guardrail;

at least one support post having an upper portion and a lower portion, the upper portion having a lower end and the lower portion having an upper end;

the upper portion being coupled to the guardrail and the lower portion being structured and arranged to be located in the earth;

the upper portion lower end being pivotally coupled to the lower portion by a hinge, the hinge having a pivot pin that extends in a strong direction, wherein the post exhibits a high mechanical strength in the strong direction, the hinge having a weak direction that is generally perpendicular to the strong direction, wherein the upper portion can rotate relative to the lower direction from an impact in the weak direction; and

the hinge is releasably restrained from pivoting by a shear pin, the shear pin being smaller in diameter than the pivot pin.

25. The roadway guardrail system of Claim 24 wherein the upper and lower portions each comprise an I-beam with the webs of the I-beams being oriented generally perpendicular to the guardrail.

25

26. The roadway guardrail system of Claim 24 wherein the hinge comprises:

a first U-shaped bracket and a second U-shaped bracket with portions of the first bracket being disposed within the second bracket; and

the pivot pin extending laterally through the first bracket and through adjacent portions of the first bracket and the second bracket whereby the upper portion of the post can rotate relative to the lower portion of the post.

27. The roadway guardrail system of Claim 24 wherein the hinge has a first bracket coupled to the upper portion and a second bracket coupled to the lower portion, the first bracket receiving the pivot pin by a slot, the slot being oriented so that when the upper portion is rotated relative to the lower portion, the upper portion can separate from the lower portion.

28. A support post for mounting a guardrail thereon as part of a highway guardrail system comprising:

an elongated body having a first portion and a second portion;

5 a frangible connection for coupling the first portion with the second portion; and

the frangible connection oriented relative to the guardrail whereby an impact with one end of the guardrail will tend to buckle the support post and the support post 10 will resist a rail face impact with the guardrail.

29. The support post of Claim 28 further comprising:

the elongated body having a first end and a second end; and

15 a plurality of slots formed in the elongated body intermediate the first end and the second end to define in part the frangible connection.

20 30. The support post of Claim 28 wherein the frangible connection further comprises a rotatable coupling assembly disposed between the upper portion and the lower portion of the elongated body.

25 31. The support post of Claim 28 wherein the frangible connection further comprises a releasable hinge.

Add A2>

Add B1>

Add C1>

Add f4

Add I5>